



## **Sterol metabolism enzymes**

**Description of Technology:** This invention is in the field of plant molecular biology. More specifically, this invention pertains to nucleic acid fragments encoding sterol metabolism enzymes in plants and seeds.

### **Patent Listing:**

1. **US Patent No. 6,465,717**, Issued October 15, 2002, "Sterol metabolism enzymes"  
<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6465717>
2. **US Patent No. 6,969,785**, Issued November 29, 2005, "Sterol metabolism enzymes"  
<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6969785>

**Market Potential:** Conversion of 7-dehydrocholesterol to cholesterol is the last reaction in the cholesterol biosynthesis pathway catalyzed by the microsomal enzyme 7-dehydrocholesterol-delta 7 reductase (EC 1.3.1.21). Inhibiting the last step in cholesterol biosynthesis profoundly reduces tissue and plasma cholesterol concentrations and accumulates precursors that substantially slow hepatoma growth. Inhibiting late cholesterol synthesis also hinders the growth of rapidly enlarging malignant tumors (Xu, G. et al. (1996) *Hepatology* 24:440-445). Analyses of the cDNA encoding the human delta 7 sterol reductase shows that this enzyme is a membrane-bound protein containing 6 to 9 putative transmembrane segments and is structurally related to plant and yeast sterol reductases. The delta 7 sterol reductase is absent from yeast. Microsomes from *Saccharomyces cerevisiae* strains heterologously expressing the human delta 7 reductase cDNA remove the C7-8 double bond in 7-dehydrocholesterol in a NADPH-dependent manner (Moebius, F. F. et al. (1998) *Proc. Natl. Acad. Sci. USA* 95:1899-1902).

### **Benefits:**

- Slows the growth pace of hepatoma and some tumors

### **Applications:**

- Plant molecular biology

### **Contact: Ken Anderson**

*Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)*  
Carvel State Building, 820 French Street, Wilmington, DE, 19801  
Phone: (302) 577-8496, Fax: (302) 577-8499, Email: [Kenneth.R.Anderson@state.de.us](mailto:Kenneth.R.Anderson@state.de.us)